

REMARKS

Status of the Case

The present invention provides novel lithium mixed-metal materials that are useful in rechargeable lithium batteries. These materials have the nominal formula $\text{LiM}_{1-y}\text{M}_{\text{II}}_y\text{PO}_4$, wherein M_I is at least one transition metal from Groups 4 to 11 of the Periodic Table and has a +2 valence state; M_{II} is at least one metallic element which is from Group 2, 12, or 14 of the Periodic Table and has a +2 valence state; and $0 < y < 1$.

In the Office Action dated July 2, 2001, the Examiner issued a restriction requirement and a requirement for election of species. In this response, Applicants traverse the restriction and election requirements.

Applicants have also amended the Specification to correct two minor typographical errors. Claims 1 – 37 have been replaced with new Claims 42 – 134. Support for these claims is found in the claims as filed, and on page 7, lines 6 – 21 of the specification. The table below shows the general correspondence of the independent claims presented in this amendment, to the claims originally presented (although the specific claim language has been changed). These amendments have been made in order to better focus on various embodiments among those preferred by the Applicants. After this amendment, Claims 38 – 134 are pending.

New Independent Claim	Corresponding Claim as Filed (now cancelled in this amendment)
42	11
55	10
56	1
87	23
90	---
96	14
108	35
113	---
121	26

The Restriction Requirement

In the Office Action a restriction requirement was issued requiring election of one of two alleged patentably distinct inventions. These inventions are defined as follows.

- I. Claims 1-37, drawn to electrodes and active olivine materials
- II. Claims 38 – 41, drawn to an electrode and active material methods of the formula LiV₂O₅.

The Examiner alleged that the materials of Groups I and II are unrelated, stating that the “different inventions have different modes of operation, different functions, and different effects, as the two inventions are directed to electrodes with unrelated electrode active materials.”

Applicants Respectfully Traverse the Restriction Requirement.

Under 35 U.S.C. §121, a restriction requirement can be made only if two or more independent and distinct inventions are claimed in the same application. However, in this application the defined groups are related, in that they are both relate to lithium active materials for use in batteries. Applicants submit that the examination of the two groups of claims together would not present an undue burden. Accordingly, Applicant requests withdrawal of the restriction requirement.

Applicants Elect Group I.

Although Applicants traverse the restriction requirement, Applicants elect prosecution of the claims of Group I (new Claims 42 – 143). Claims directed to Group II (original Claims 37 - 41) will be cancelled in the event the restriction requirement is maintained.

The Election of Species Requirement

The Examiner also issued a requirement for election of species, defining eighteen groups of materials within Group I of the restriction requirement.

Applicants Traverse the Election Requirement.

As discussed above, the allegedly distinct species defined by the Examiner are all related, in their operation as actives in electrochemical cells. Moreover, the Examiner has provided no reasoning for why the species are distinct. Applicants submit that no undue burden would be created by simultaneous examination of the defined groups of species. Accordingly, Applicants respectfully submit that the election of

species requirement is improper and request withdrawal of the election of species requirement.

Applicants Elect the Species of Group 10.

Although Applicants traverse the election of species requirements, Applicants elect prosecution of the species of Group 10, where MI is Fe and MII is Mg, Ca, Sr, Be, and Ba. Claims readable on this species would be Claims 42 – 50, 52 – 74, 79 – 91, 93, 94, 96 – 103, 107 – 116, 118, 119, 121 – 130, and 134.

Applicants submit that the materials, electrodes, and batteries of this invention are novel, non-obvious and patentable. Applicants respectfully request allowance of all claims.

Respectfully submitted,

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Description of Specification Amendments

The following is a marked up version of the amendments to the specification.
Underlining indicates added language; brackets indicate deletions.

The paragraph on page 35, beginning on line 16 and ending on line 18, is amended as follows.

Part II. Preparation of LiFePO₄ from the Fe₃(PO₄)₂ of Part I.



The paragraph on page 39, beginning on line 15 and ending on line 19, is amended as follows.

Reaction 4. Formation of LiFe_{0.9}Zn_{0.1}PO₄
(LiFe_{1-y}Zn_yPO₄) from Fe₂O₃

